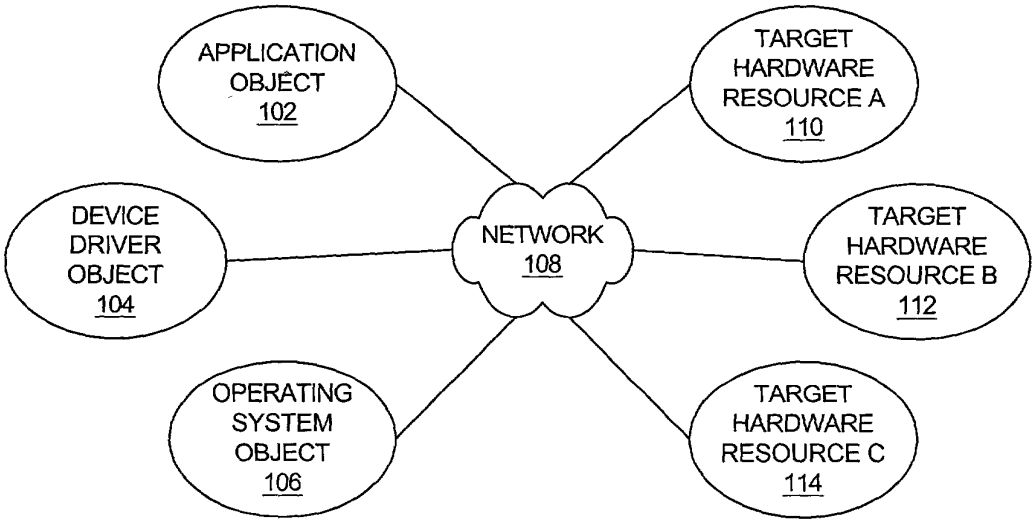

FIG. 1
(PRIOR ART)

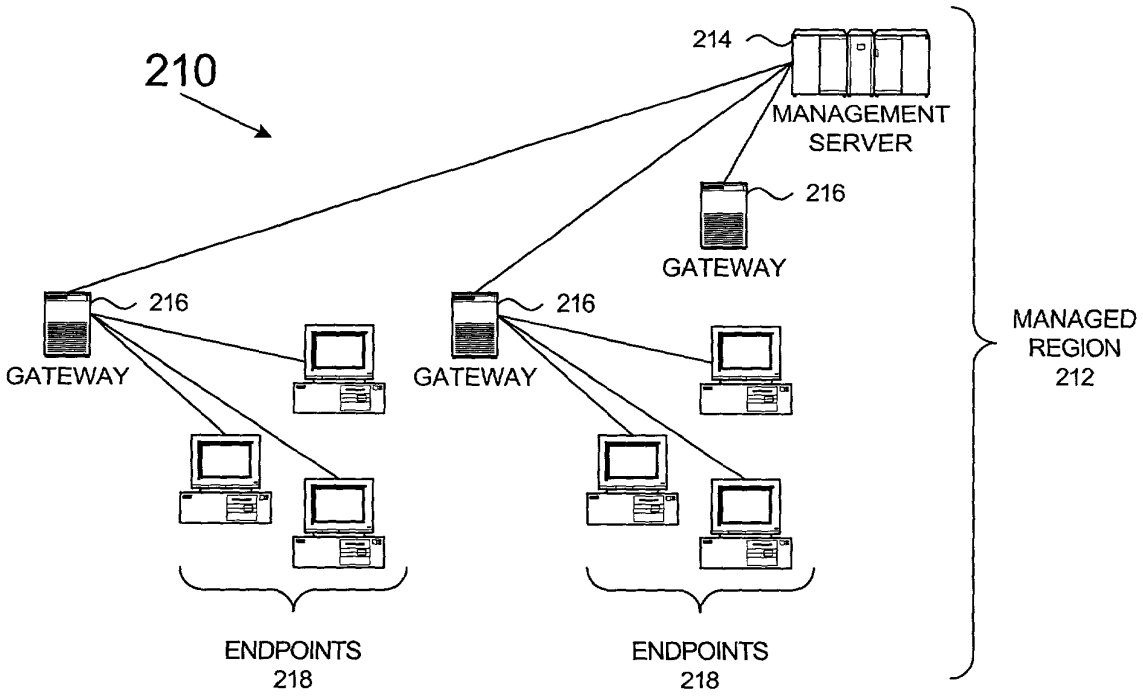

FIG. 2A

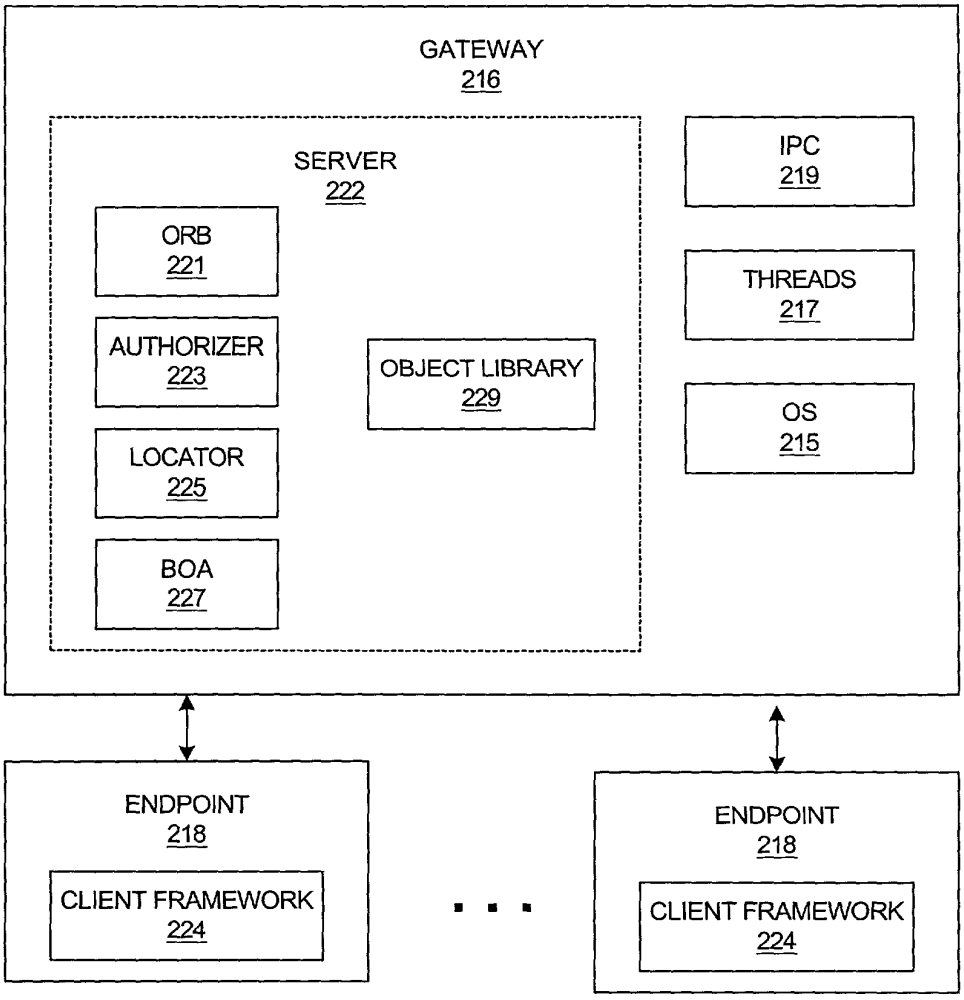
GATEWAY
216
SERVER
222
ORB
221
AUTHORIZER
223
LOCATOR
225
BOA
227
OBJECT LIBRARY
229
IPC
219
THREADS
217
OS
215
ENDPOINT
218
CLIENT FRAMEWORK
224
ENDPOINT
218
CLIENT FRAMEWORK
224

FIG. 2B

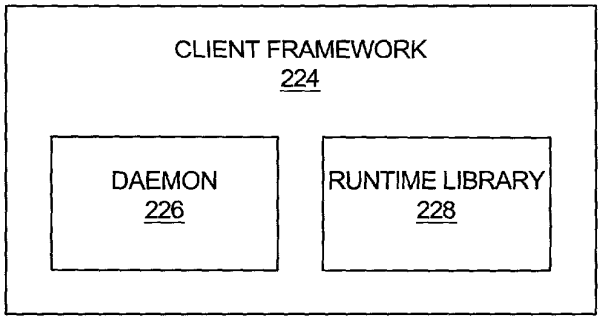
CLIENT FRAMEWORK
224
DAEMON
226
RUNTIME LIBRARY
228

FIG. 2C

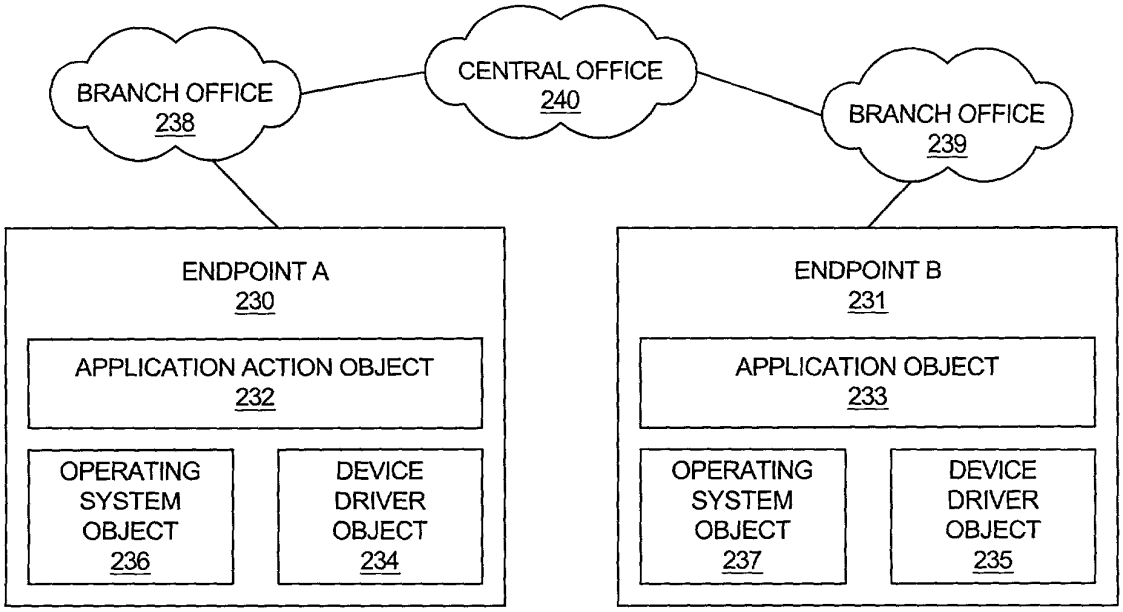

FIG. 2D

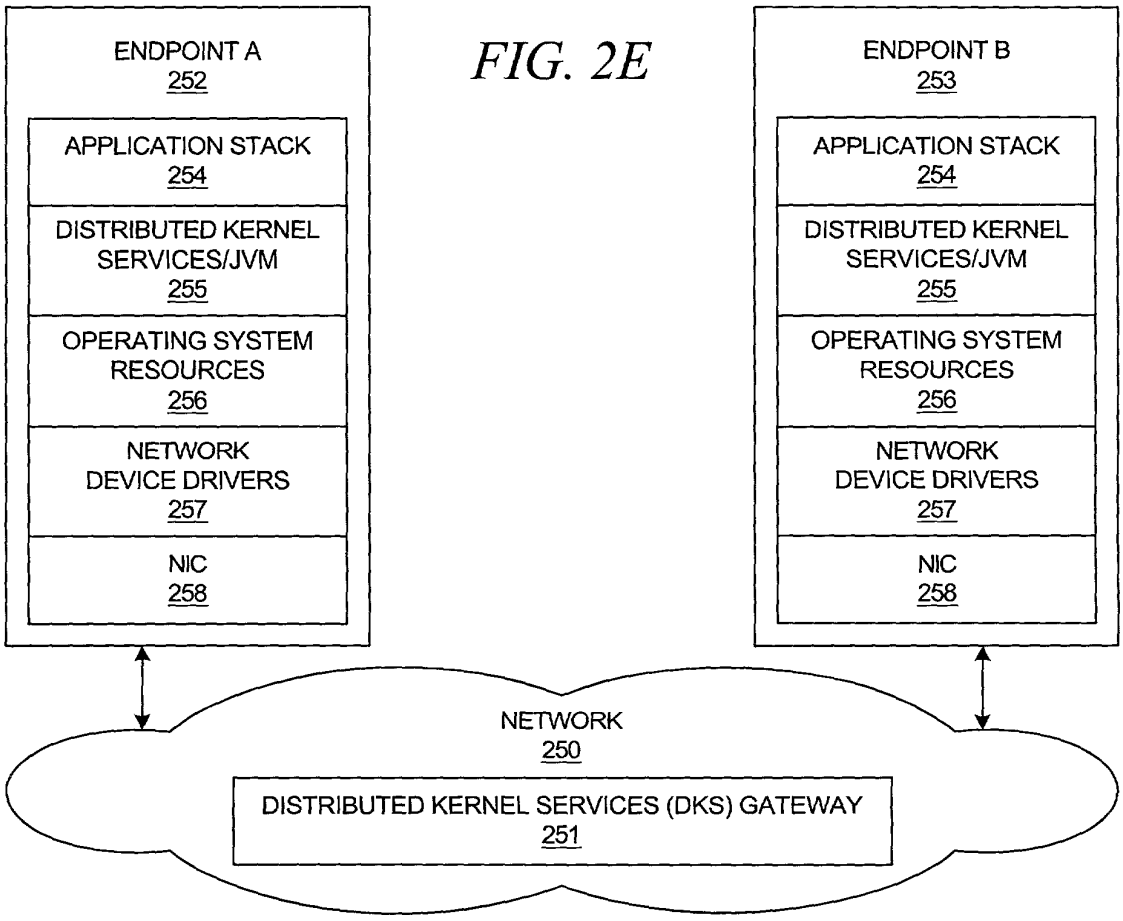

FIG. 2E

Page 5 of 55

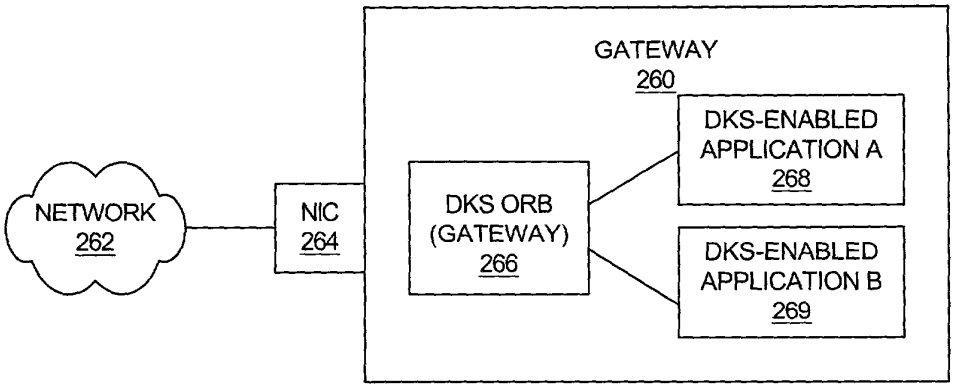
GATEWAY
260
DKS-ENABLED APPLICATION A
268
NETWORK
262
NIC
264
DKS ORB (GATEWAY)
266
DKS-ENABLED APPLICATION B
269

FIG. 2F

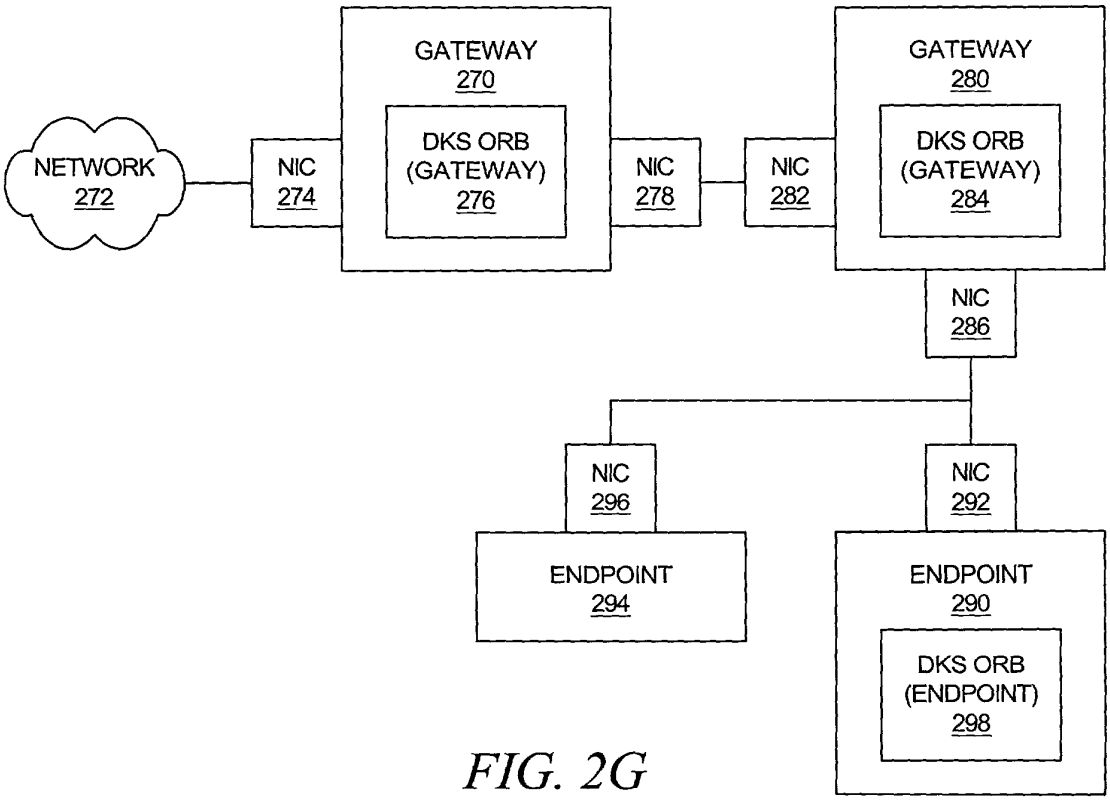
GATEWAY
270
GATEWAY
280
NETWORK
272
NIC
274
DKS ORB (GATEWAY)
276
NIC
278
NIC
282
DKS ORB (GATEWAY)
284
NIC
286
NIC
296
NIC
292
ENDPOINT
294
ENDPOINT
290
DKS ORB (ENDPOINT)
298

FIG. 2G

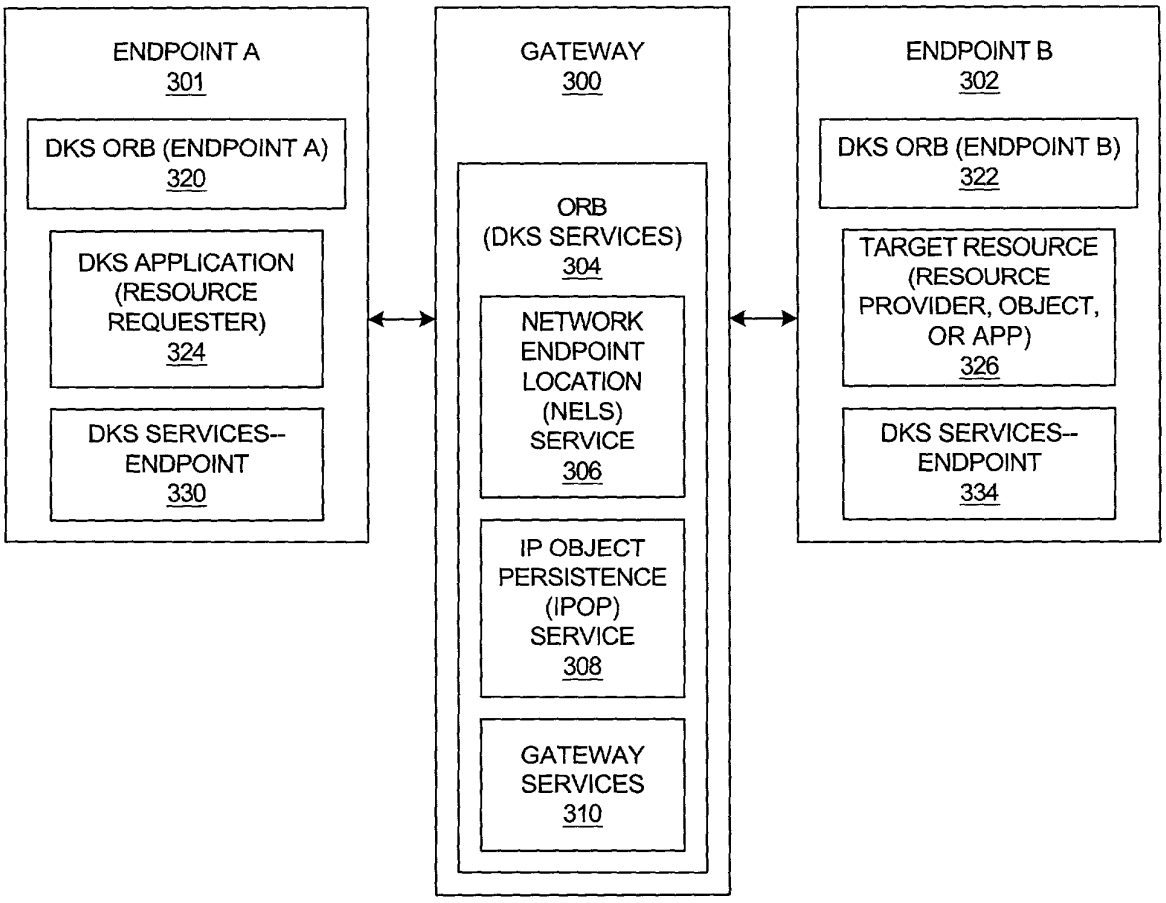
ENDPOINT A
301
DKS ORB (ENDPOINT A)
320
DKS APPLICATION (RESOURCE REQUESTER)
324
DKS SERVICES--ENDPOINT
330
GATEWAY
300
ORB (DKS SERVICES)
304
NETWORK ENDPOINT LOCATION (NELS) SERVICE
306
IP OBJECT PERSISTENCE (IPOP) SERVICE
308
GATEWAY SERVICES
310
ENDPOINT B
302
DKS ORB (ENDPOINT B)
322
TARGET RESOURCE (RESOURCE PROVIDER, OBJECT, OR APP)
326
DKS SERVICES--ENDPOINT
334

FIG. 3

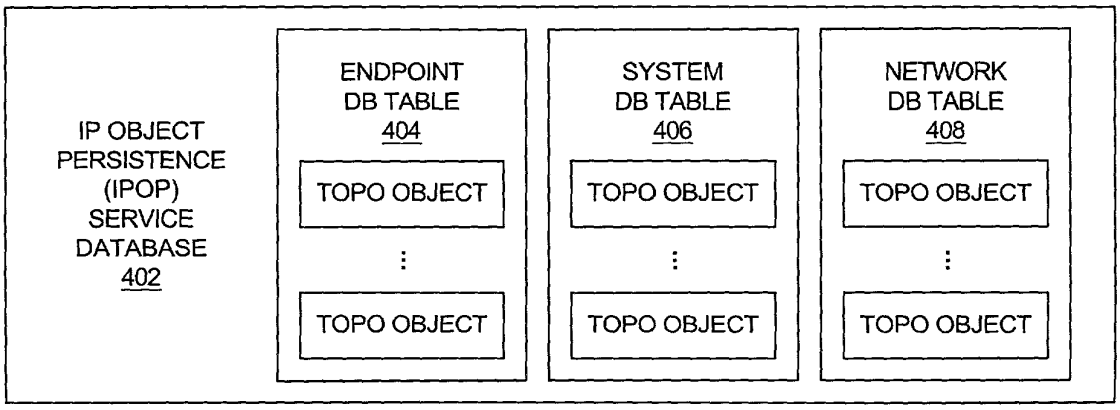
IP OBJECT PERSISTENCE (IPOP) SERVICE DATABASE
402
ENDPOINT DB TABLE
404
TOPO OBJECT
TOPO OBJECT
SYSTEM DB TABLE
406
TOPO OBJECT
TOPO OBJECT
NETWORK DB TABLE
408
TOPO OBJECT
TOPO OBJECT

FIG. 4

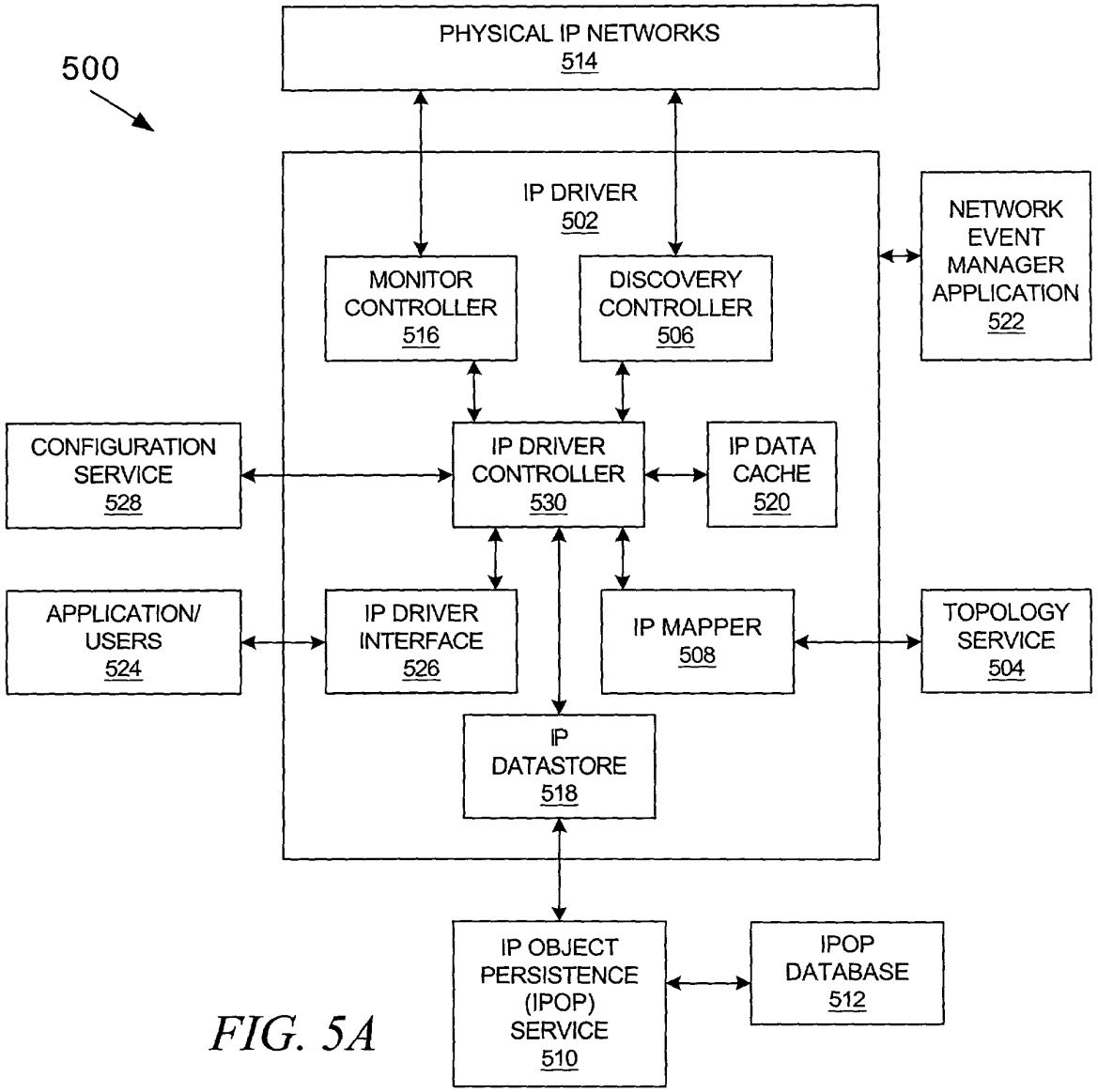

FIG. 5A

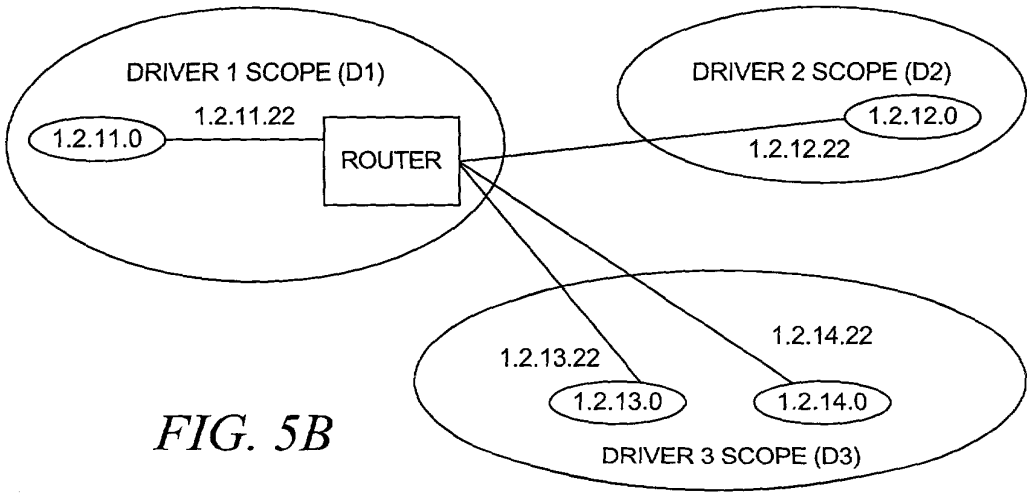

FIG. 5B

09895757.062901

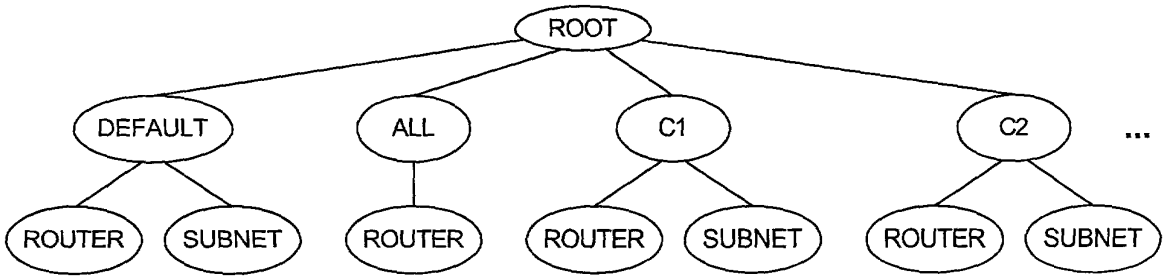

FIG. 5C

09/895,757 - 062901

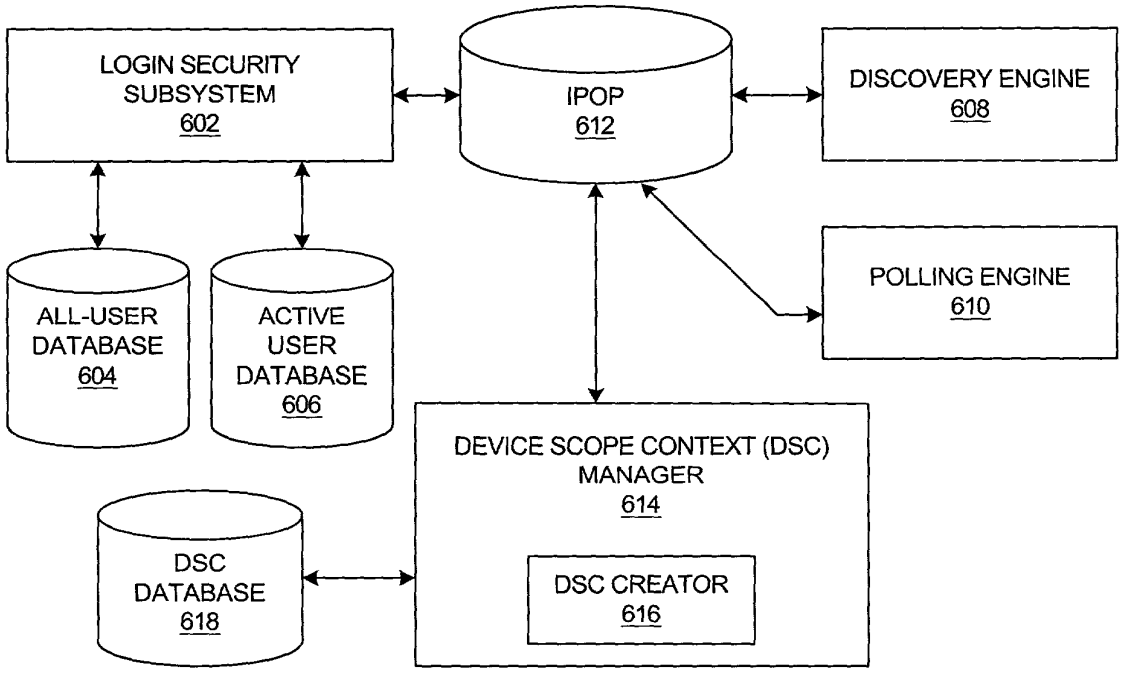

FIG. 6

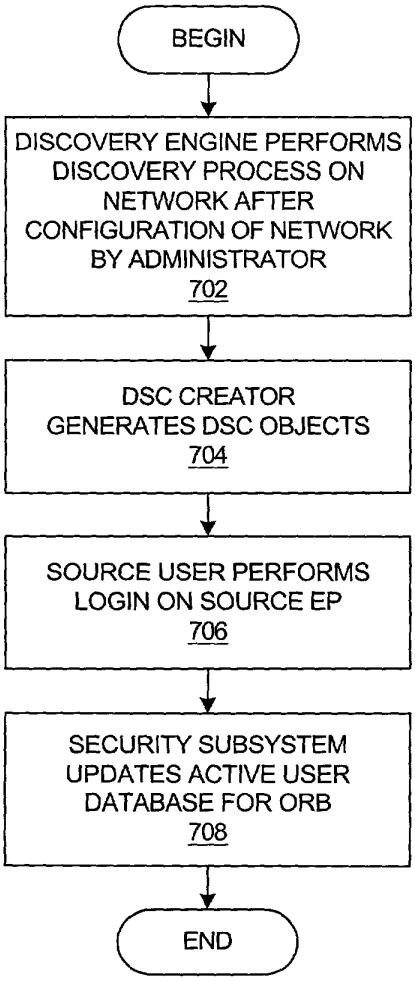

FIG. 7A

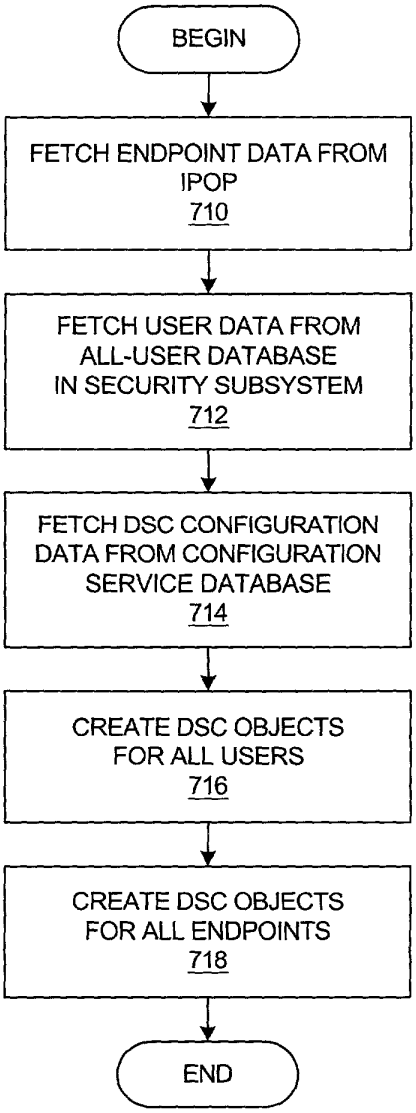

FIG. 7B

FP6329-US-2/5/2006

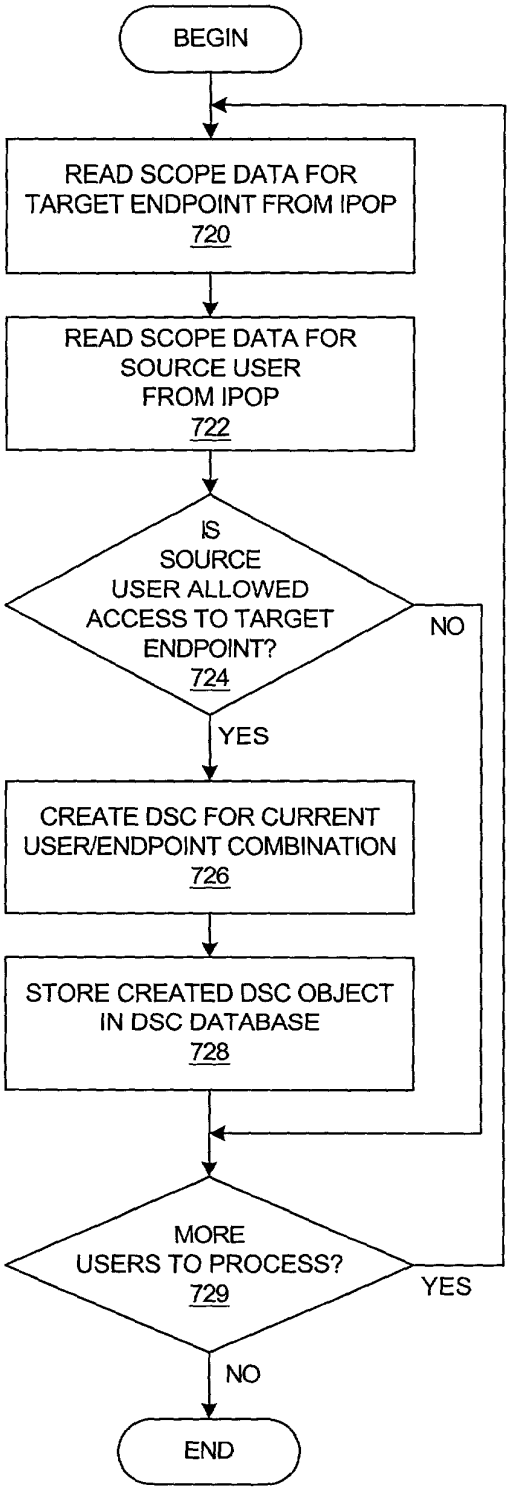

FIG. 7C

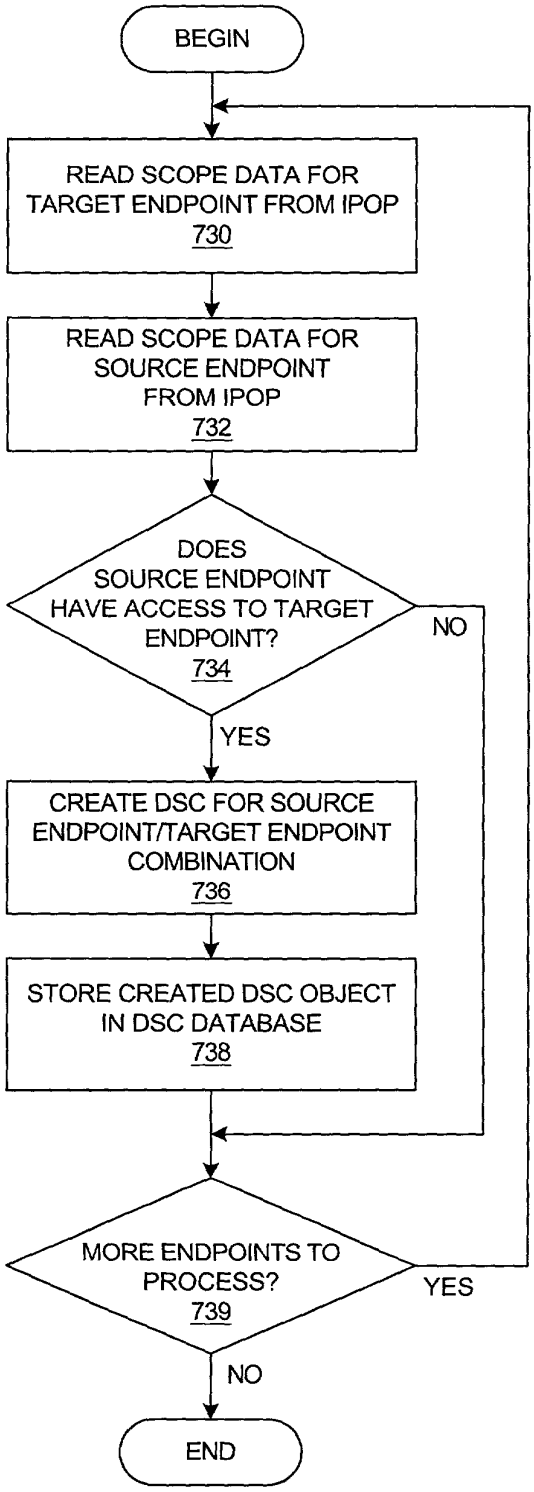

FIG. 7D

Patent Application Publication

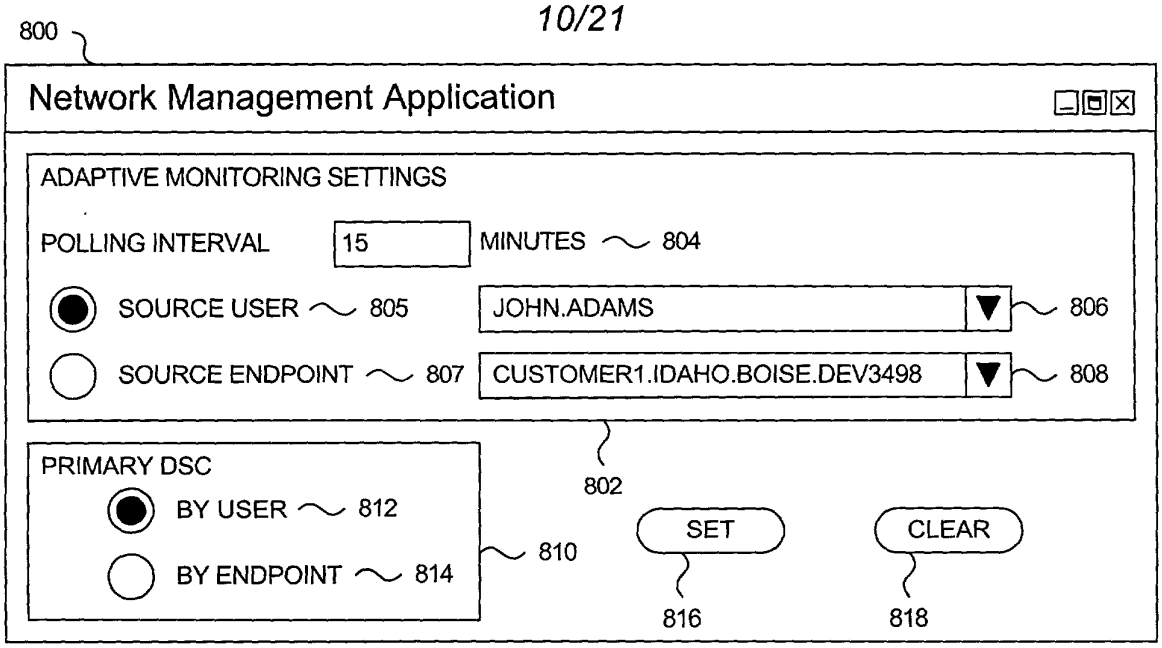

FIG. 8A

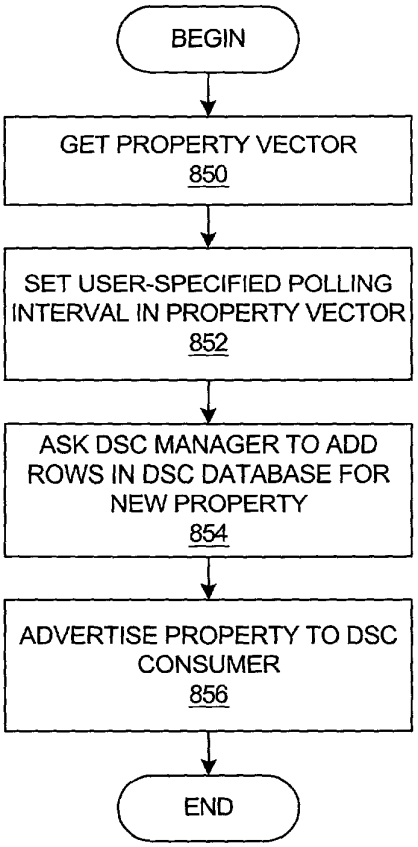

FIG. 8C

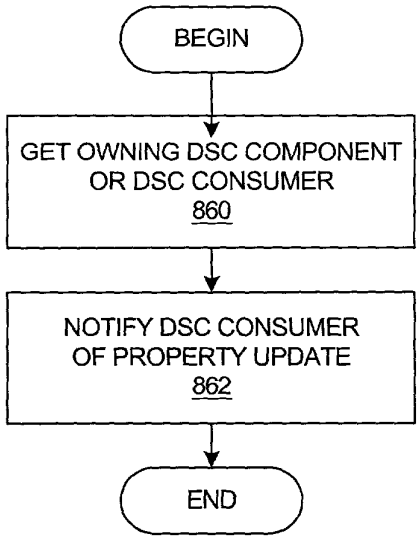

FIG. 8D

Page 57 of 96

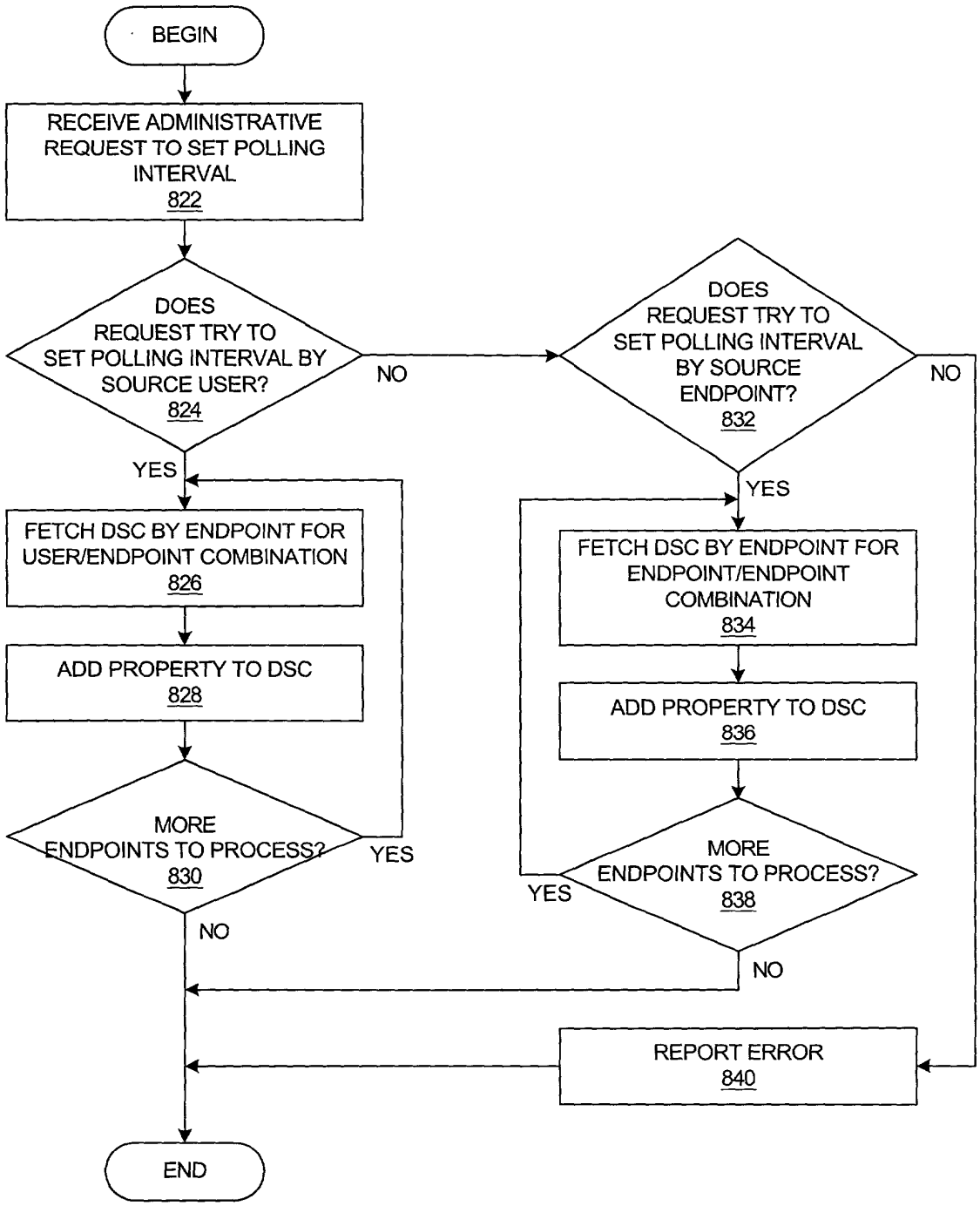
BEGIN
RECEIVE ADMINISTRATIVE REQUEST TO SET POLLING INTERVAL
822
DOES REQUEST TRY TO SET POLLING INTERVAL BY SOURCE USER?
824
NO
YES
DOES REQUEST TRY TO SET POLLING INTERVAL BY SOURCE ENDPOINT?
832
NO
YES
FETCH DSC BY ENDPOINT FOR USER/ENDPOINT COMBINATION
826
ADD PROPERTY TO DSC
828
MORE ENDPOINTS TO PROCESS?
830
YES
NO
FETCH DSC BY ENDPOINT FOR ENDPOINT/ENDPOINT COMBINATION
834
ADD PROPERTY TO DSC
836
MORE ENDPOINTS TO PROCESS?
838
YES
NO
REPORT ERROR
840
END

FIG. 8B

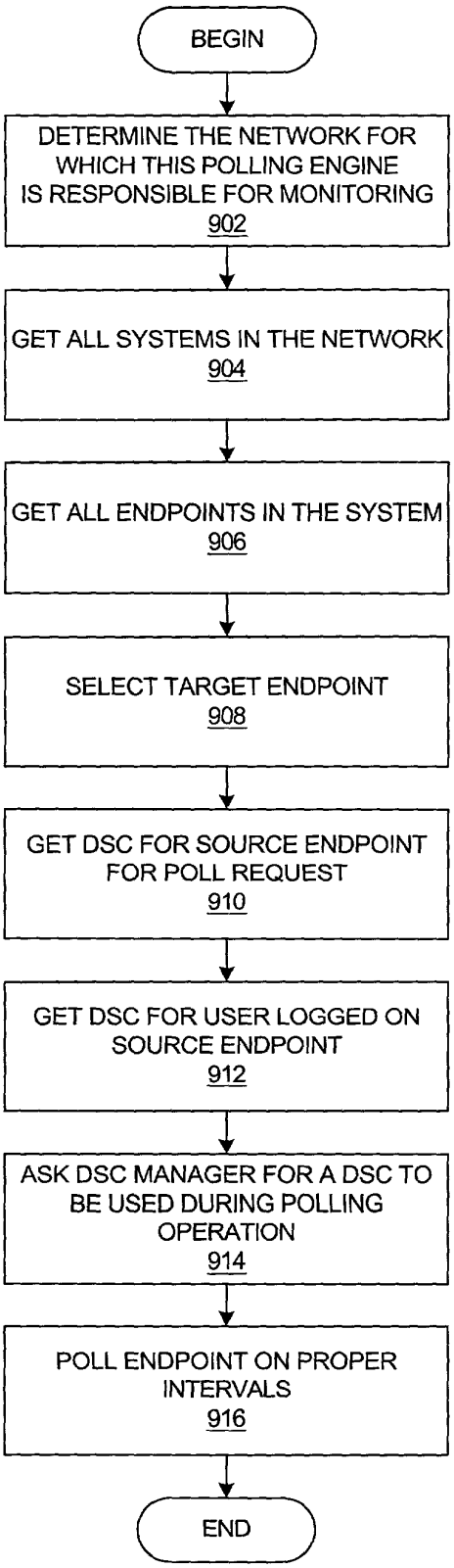

FIG. 9A

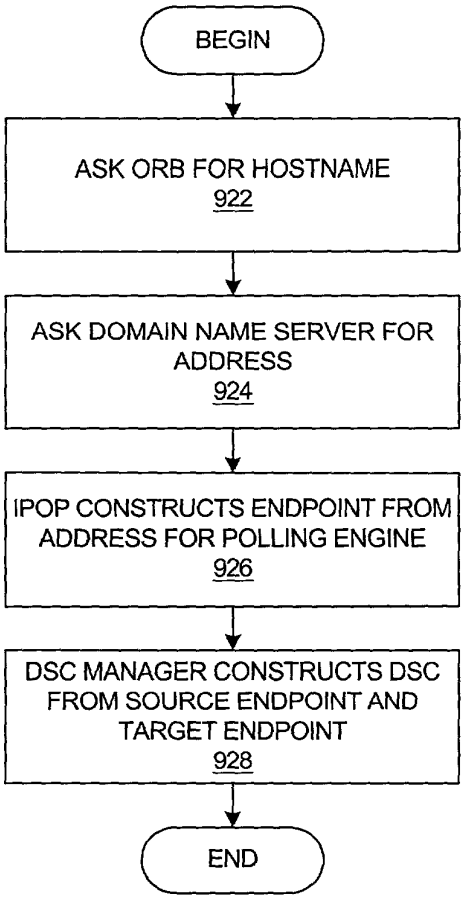

FIG. 9B

Doc 5,959,597 - Oct 5, 1999

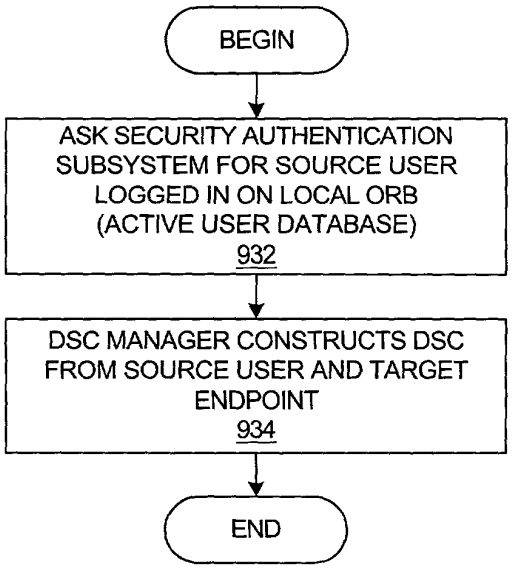

FIG. 9C

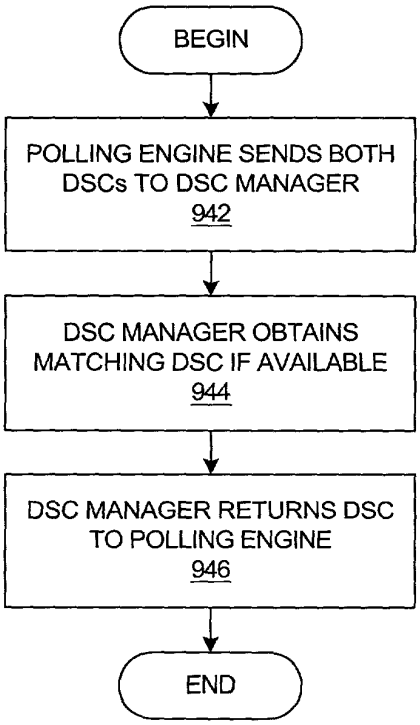

FIG. 9D

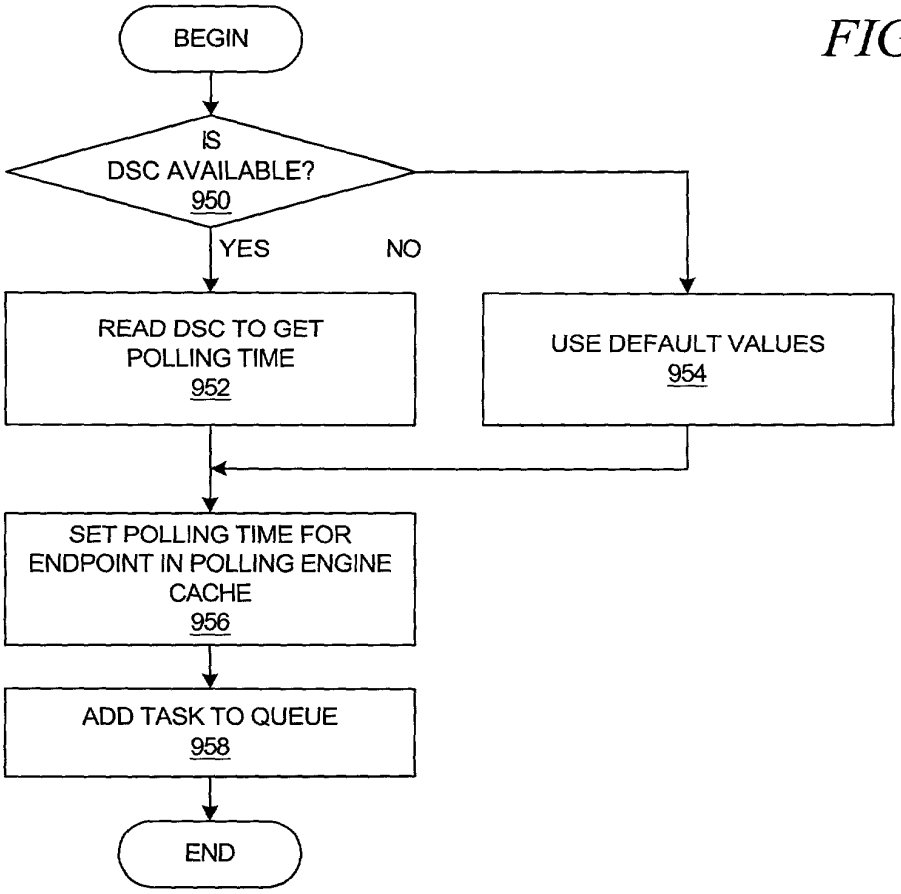

FIG. 9E

Express Mail Label No. EV 725 568 650

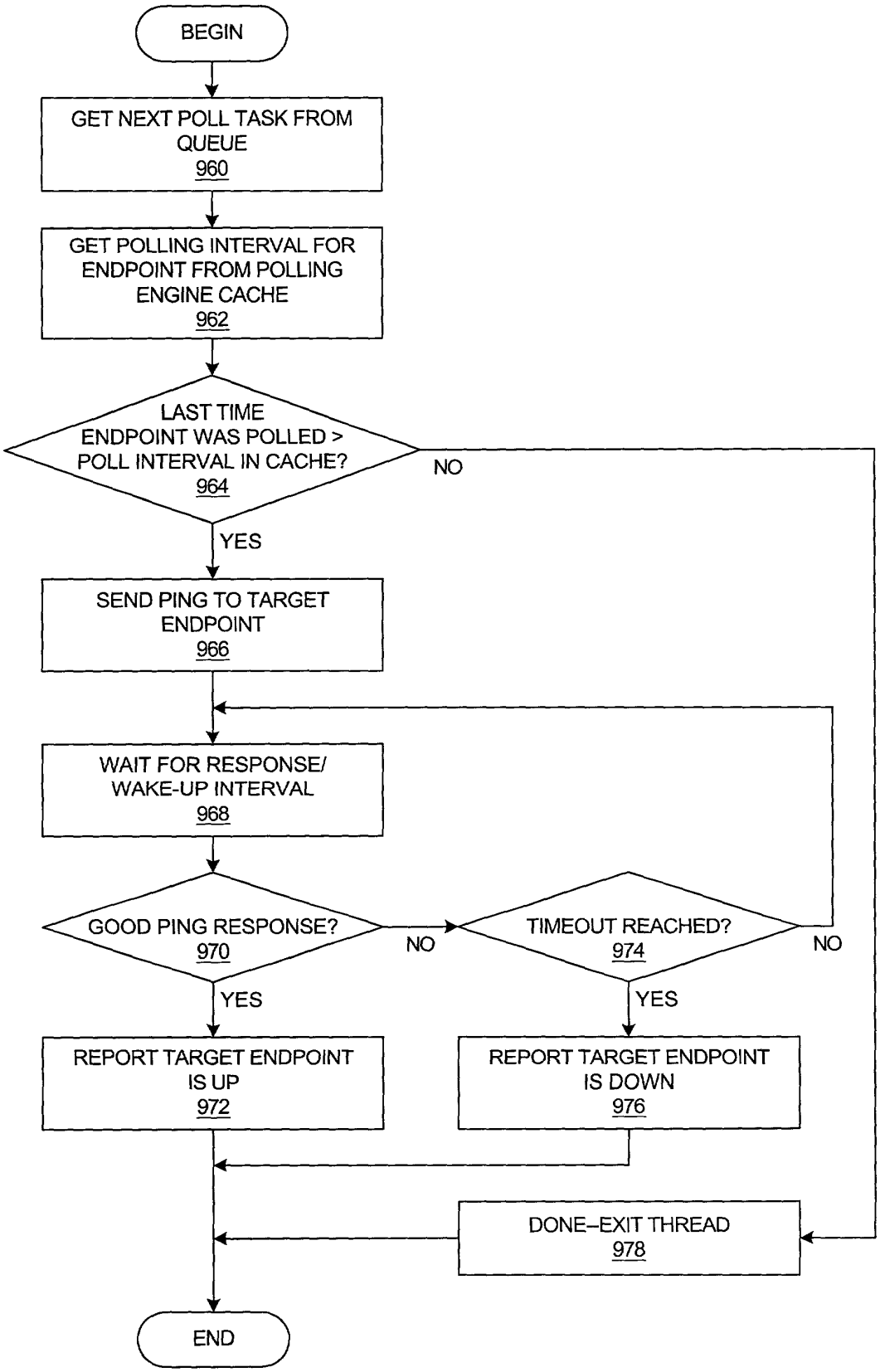
BEGIN
GET NEXT POLL TASK FROM QUEUE
960
GET POLLING INTERVAL FOR ENDPOINT FROM POLLING ENGINE CACHE
962
LAST TIME ENDPOINT WAS POLLED > POLL INTERVAL IN CACHE?
964
NO
YES
SEND PING TO TARGET ENDPOINT
966
WAIT FOR RESPONSE/ WAKE-UP INTERVAL
968
GOOD PING RESPONSE?
970
NO
TIMEOUT REACHED?
974
NO
YES
YES
REPORT TARGET ENDPOINT IS UP
972
REPORT TARGET ENDPOINT IS DOWN
976
DONE–EXIT THREAD
978
END

FIG. 9F

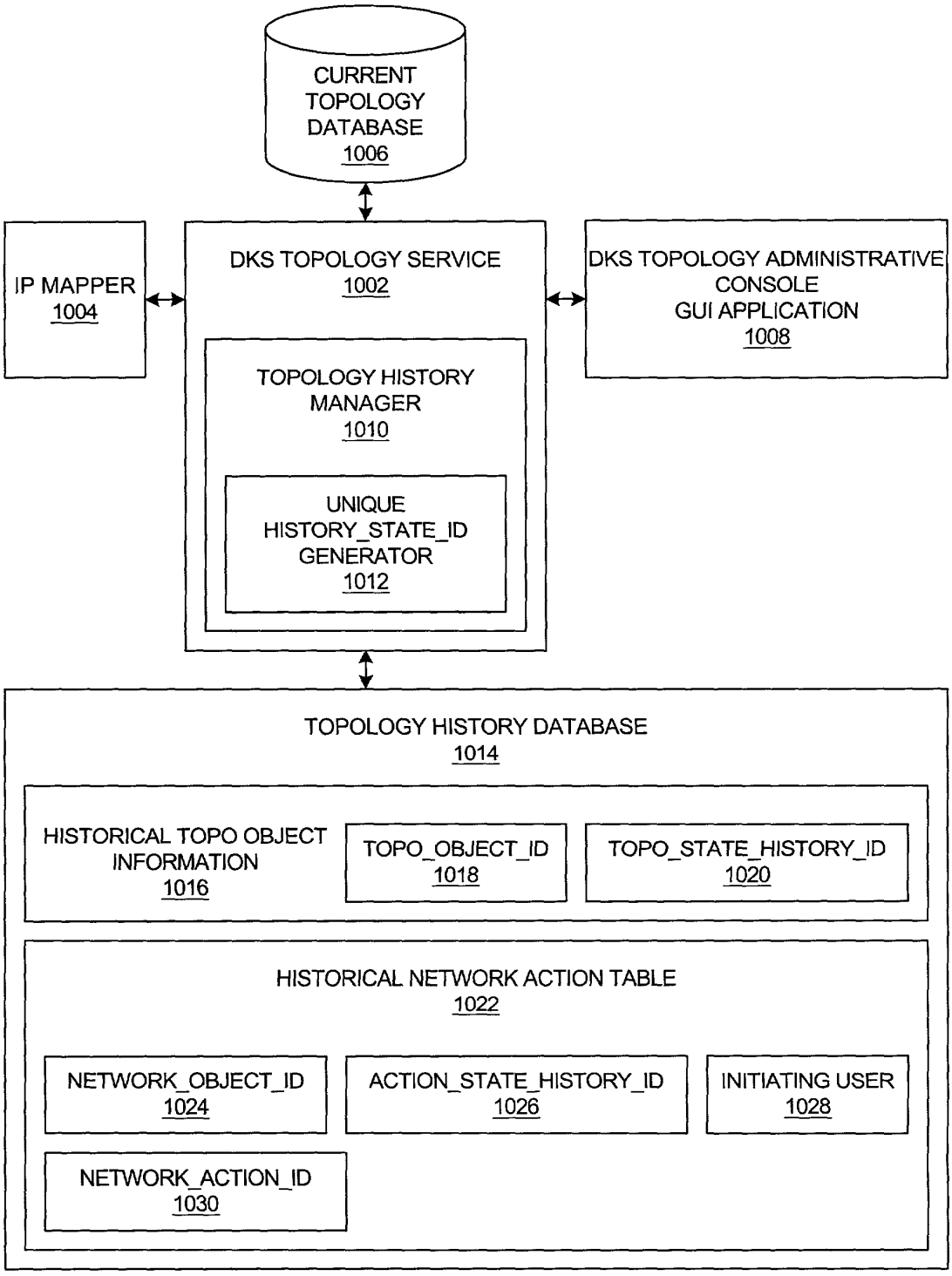
CURRENT TOPOLOGY DATABASE 1006
IP MAPPER 1004
DKS TOPOLOGY SERVICE 1002
DKS TOPOLOGY ADMINISTRATIVE CONSOLE GUI APPLICATION 1008
TOPOLOGY HISTORY MANAGER 1010
UNIQUE HISTORY_STATE_ID GENERATOR 1012
TOPOLOGY HISTORY DATABASE 1014
HISTORICAL TOPO OBJECT INFORMATION 1016
TOPO_OBJECT_ID 1018
TOPO_STATE_HISTORY_ID 1020
HISTORICAL NETWORK ACTION TABLE 1022
NETWORK_OBJECT_ID 1024
ACTION_STATE_HISTORY_ID 1026
INITIATING USER 1028
NETWORK_ACTION_ID 1030

FIG. 10

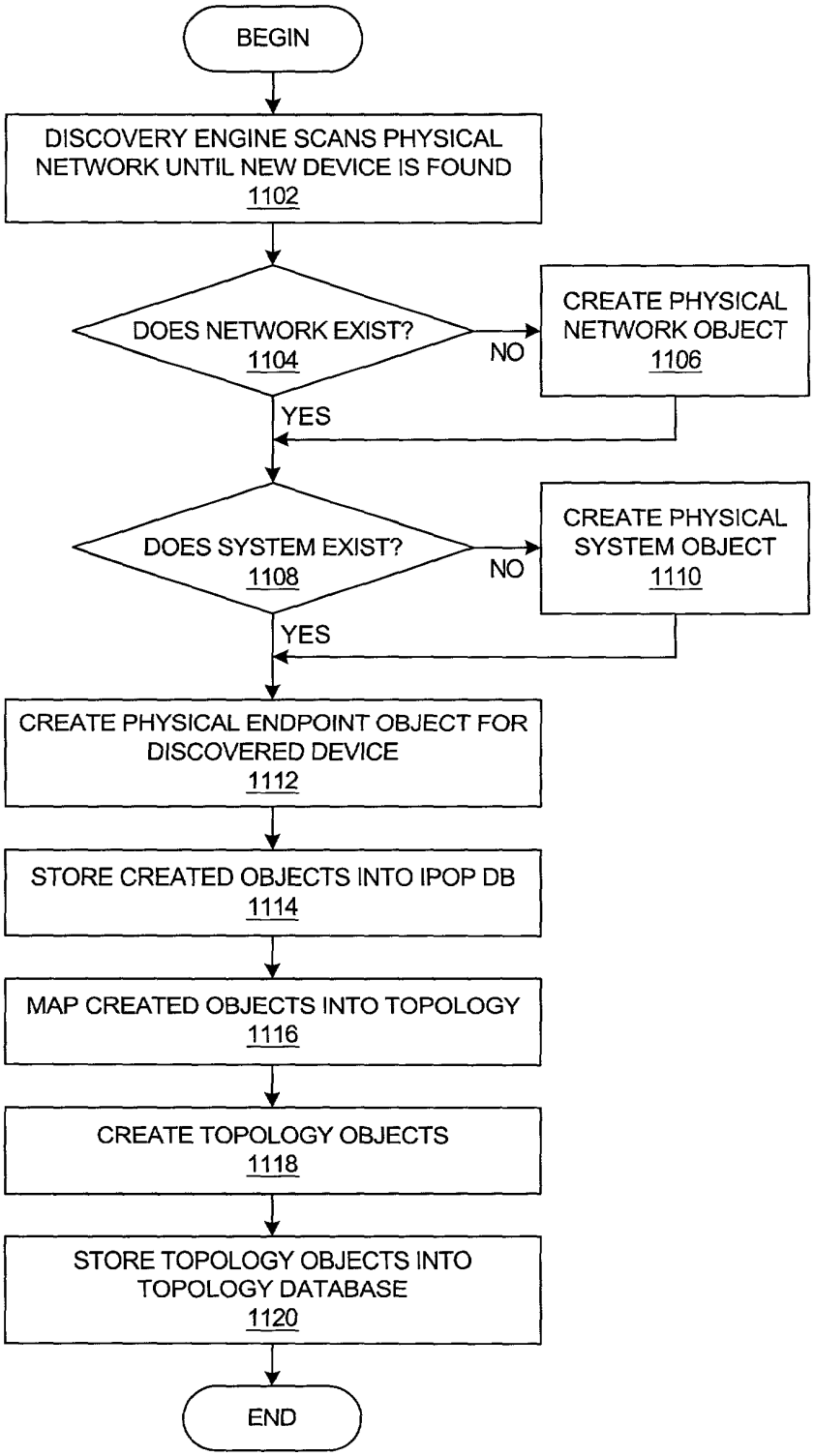
BEGIN
DISCOVERY ENGINE SCANS PHYSICAL NETWORK UNTIL NEW DEVICE IS FOUND
1102
DOES NETWORK EXIST?
1104
NO
CREATE PHYSICAL NETWORK OBJECT
1106
YES
DOES SYSTEM EXIST?
1108
NO
CREATE PHYSICAL SYSTEM OBJECT
1110
YES
CREATE PHYSICAL ENDPOINT OBJECT FOR DISCOVERED DEVICE
1112
STORE CREATED OBJECTS INTO IPOP DB
1114
MAP CREATED OBJECTS INTO TOPOLOGY
1116
CREATE TOPOLOGY OBJECTS
1118
STORE TOPOLOGY OBJECTS INTO TOPOLOGY DATABASE
1120
END

FIG. 11A

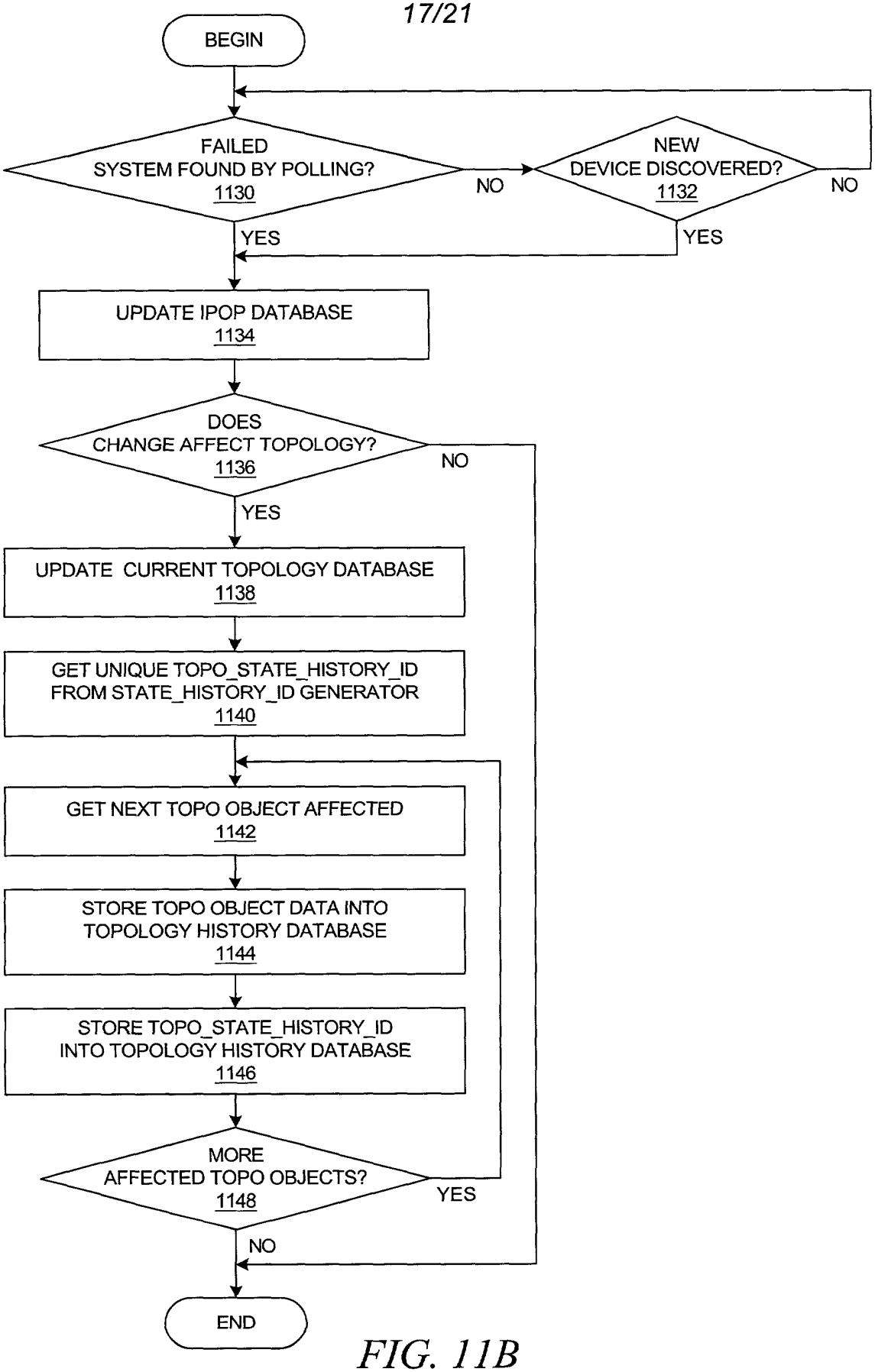
BEGIN
FAILED SYSTEM FOUND BY POLLING? 1130
NO
NEW DEVICE DISCOVERED? 1132
NO
YES
YES
UPDATE IPOP DATABASE 1134
DOES CHANGE AFFECT TOPOLOGY? 1136
NO
YES
UPDATE CURRENT TOPOLOGY DATABASE 1138
GET UNIQUE TOPO_STATE_HISTORY_ID FROM STATE_HISTORY_ID GENERATOR 1140
GET NEXT TOPO OBJECT AFFECTED 1142
STORE TOPO OBJECT DATA INTO TOPOLOGY HISTORY DATABASE 1144
STORE TOPO_STATE_HISTORY_ID INTO TOPOLOGY HISTORY DATABASE 1146
MORE AFFECTED TOPO OBJECTS? 1148
YES
NO
END

FIG. 11B

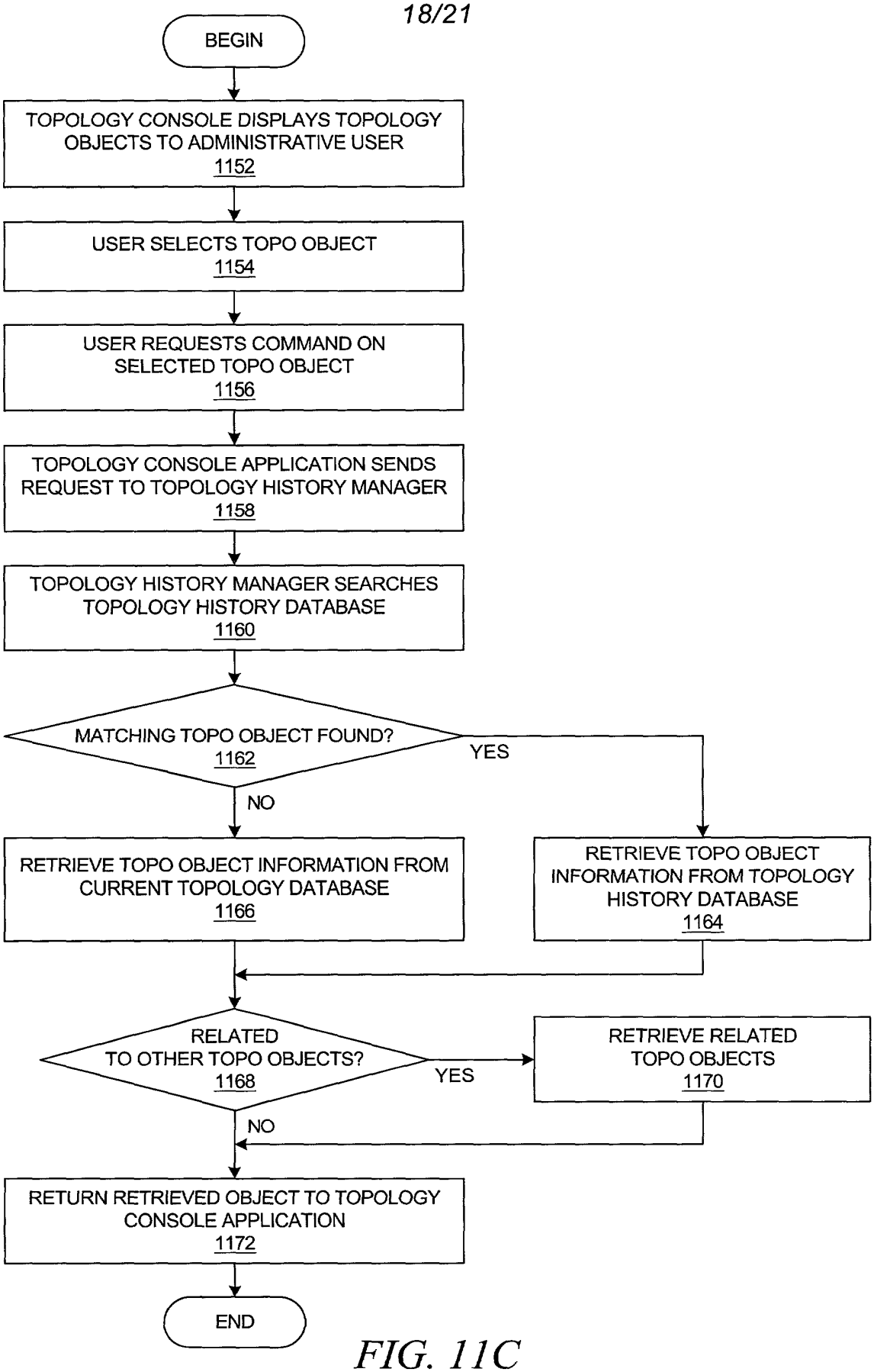
BEGIN
TOPOLOGY CONSOLE DISPLAYS TOPOLOGY OBJECTS TO ADMINISTRATIVE USER
1152
USER SELECTS TOPO OBJECT
1154
USER REQUESTS COMMAND ON SELECTED TOPO OBJECT
1156
TOPOLOGY CONSOLE APPLICATION SENDS REQUEST TO TOPOLOGY HISTORY MANAGER
1158
TOPOLOGY HISTORY MANAGER SEARCHES TOPOLOGY HISTORY DATABASE
1160
MATCHING TOPO OBJECT FOUND?
1162
YES
NO
RETRIEVE TOPO OBJECT INFORMATION FROM CURRENT TOPOLOGY DATABASE
1166
RETRIEVE TOPO OBJECT INFORMATION FROM TOPOLOGY HISTORY DATABASE
1164
RELATED TO OTHER TOPO OBJECTS?
1168
YES
RETRIEVE RELATED TOPO OBJECTS
1170
NO
RETURN RETRIEVED OBJECT TO TOPOLOGY CONSOLE APPLICATION
1172
END

FIG. 11C

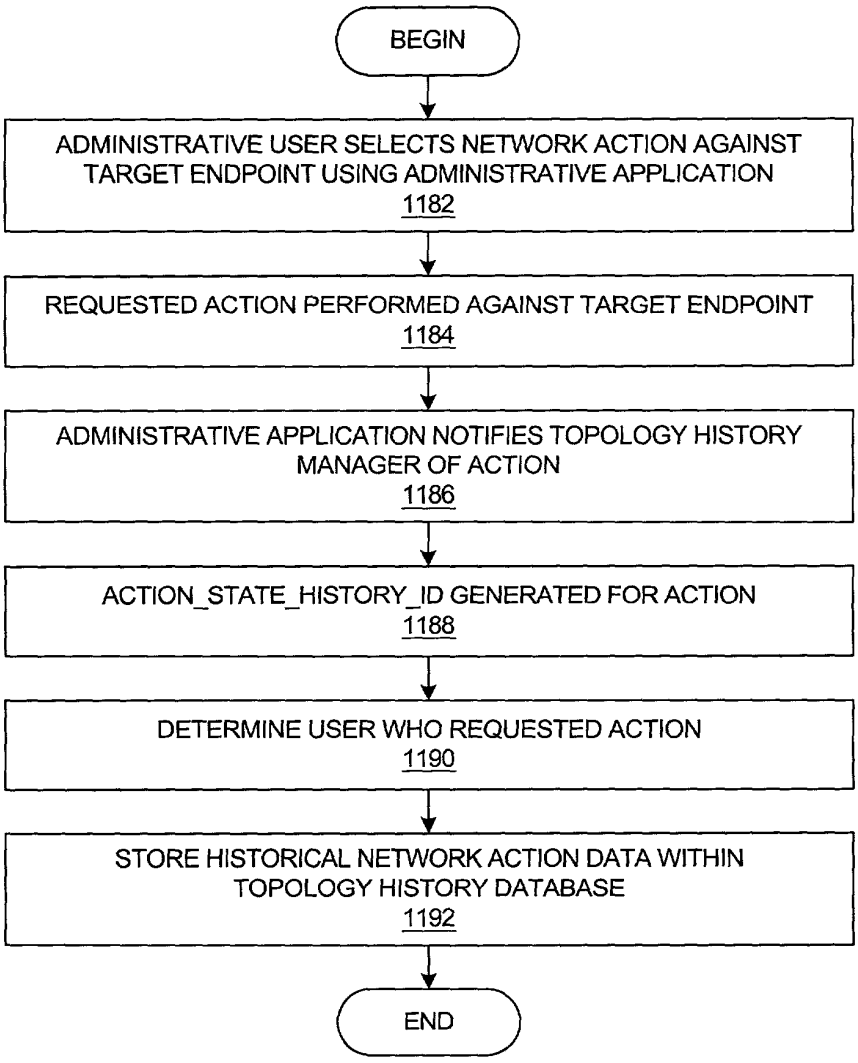

FIG. 11D

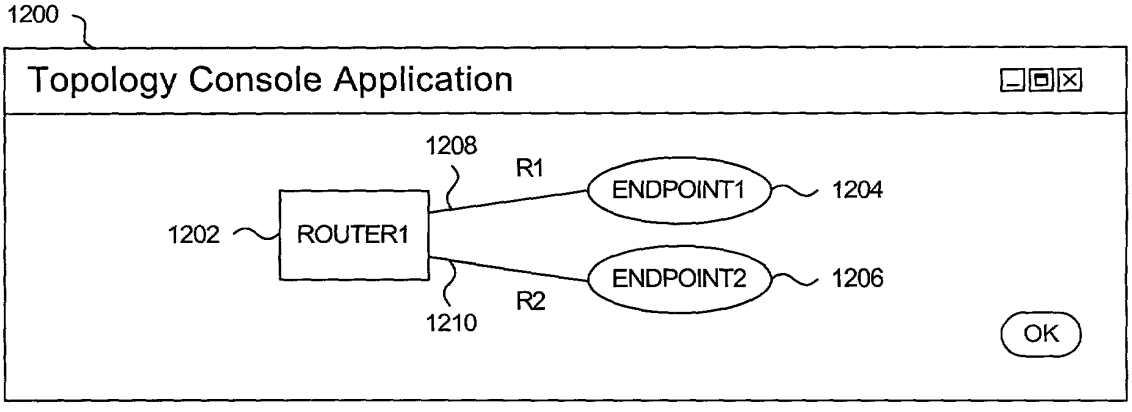

FIG. 12A

CURRENT TOPOLOGY DATABASE
1222

DESCRIPTION	TOPO_OBJECT_ID
ROUTER1	001
ENDPOINT1	002
ENDPOINT2	003
RELATION1	004
RELATION2	005

TOPOLOGY HISTORY DATABASE
1224

FIG. 12B

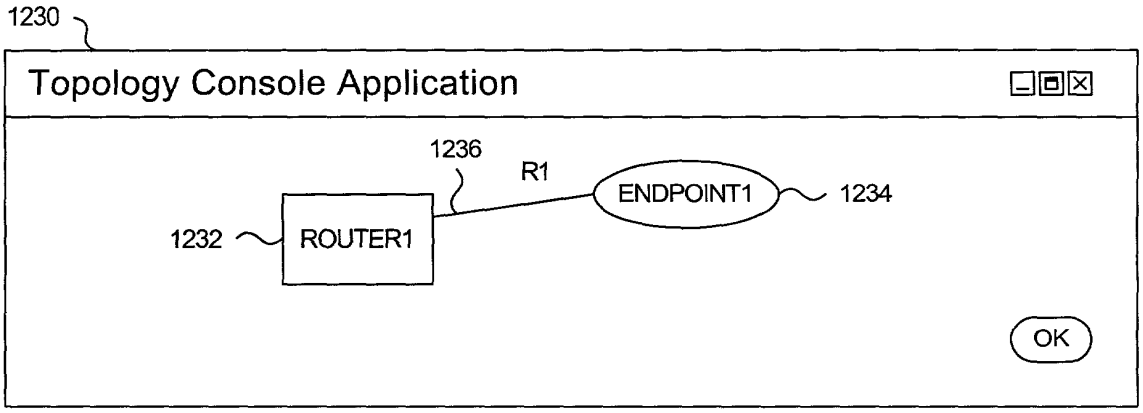

FIG. 12C

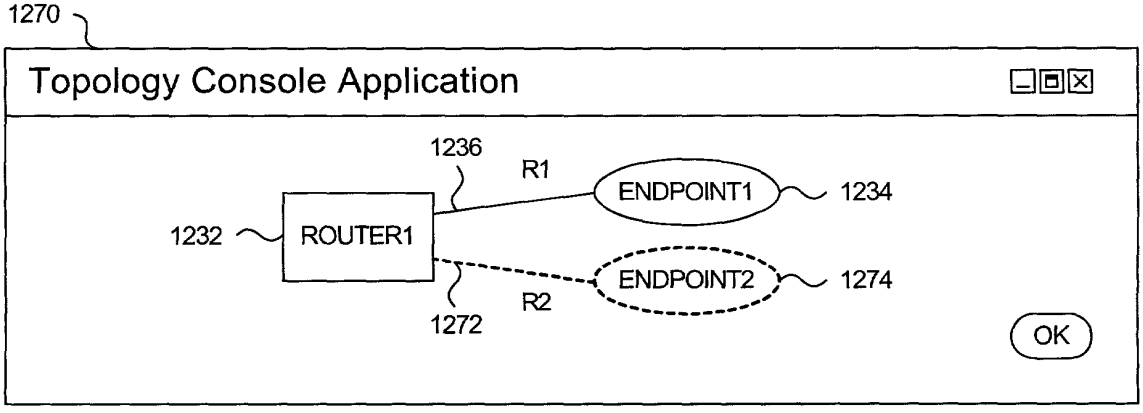

FIG. 12G

CURRENT TOPOLOGY DATABASE
1242

DESCRIPTION	TOPO_OBJECT_ID
ROUTER1	001
ENDPOINT1	002
RELATION2	005

TOPOLOGY HISTORY DATABASE
1244

DESCRIPTION	TOPO_OBJECT_ID	TOPO_STATE_HISTORY_ID
ROUTER1	001	001
ENDPOINT1	002	001
ENDPOINT2	003	001
RELATION1	004	001
RELATION2	005	001

FIG. 12D

HISTORICAL NETWORK ACTION TABLE
1252

ACTION_ID	DESCRIPTION	TOPO_OBJECT_ID	ACTION_STATE_HISTORY_ID	USER
00001	PING	005	0000	JOHN
00002	SNMPQUERY	005	0001	JOHN
00003	UNMANAGE	005	0002	JOHN
00004	MANAGE	005	0003	MARY
00002	SNMPQUERY	005	0004	MARY

FIG. 12E

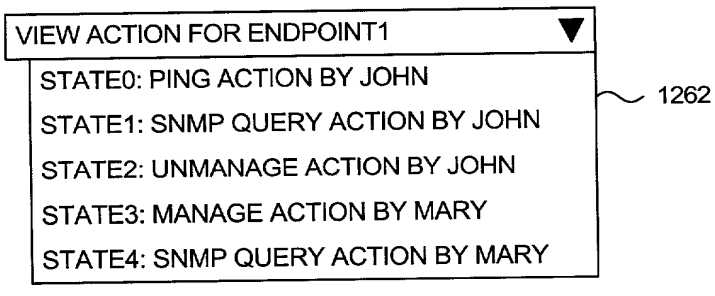

FIG. 12F